

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (Currently Amended) A method for interleaving bits of a digital signal representative of data and/or audio in a digital audio broadcasting system, the method comprising the ~~step~~ steps of:

writing a plurality of bits of the digital signal to a ~~a~~ an internal matrix; and  
reading the bits from the internal matrix, wherein at least one of the writing and reading steps follows a non-sequential addressing scheme; and  
writing the bits to an output matrix.

2. (Currently Amended) The method of claim 1, wherein the number of bits in the output matrix is equal to the number of bits in a transfer frame of the digital signal.

3. (Currently Amended) The method of claim 1, wherein the bits in the internal matrix are arranged in a plurality of partitions.

4. (Original) The method of claim 3, wherein each of the partitions comprises a plurality of blocks.

5. (Original) The method of claim 3, wherein each of the partitions includes a group of the bits representative of a logical channel.

6. (Original) The method of claim 5, wherein the bits in each logical channel are scrambled.

7. (Currently Amended) A method of broadcasting digital information representative of data and/or audio in a digital audio broadcasting system, the method comprising the steps of:

receiving a plurality of bits of a digital signal to be transmitted;  
writing the bits to a ~~a~~ an internal matrix;  
reading the bits from the internal matrix, wherein at least one of the writing and reading steps follows a non-sequential addressing scheme;

writing the bits to an output matrix;  
mapping the bits to a plurality of carrier signals; and  
transmitting the carrier signals.

8. (Currently Amended) The method of claim 7, wherein the number of bits in the output matrix is equal to the number of bits in a transfer frame of the digital signal.

9. (Currently Amended) The method of claim 7, wherein the bits in the internal matrix are arranged in a plurality of partitions.

10. (Original) The method of claim 9, wherein each of the partitions comprises a plurality of blocks.

11. (Original) The method of claim 9, wherein each of the partitions includes a group of the bits representative of a logical channel.

12. (Original) The method of claim 11, wherein the bits in each logical channel are scrambled.

13. (Currently Amended) The method of claim 7, further comprising the step of:

channel coding the bits prior to the step of writing the bits of the digital signal to the internal matrix.

14. (Currently Amended) The method of claim 7, further comprising the step of:

scrambling the bits prior to the step of writing the bits of the digital signal to the internal matrix.

15. (Currently Amended) An apparatus for interleaving bits of a digital signal representative of data and/or audio in a digital audio broadcasting system, the apparatus comprising:

means for receiving a plurality of bits of a digital signal to be transmitted;  
and

means for writing the bits to a an internal matrix; and

means for reading the bits from the internal matrix, wherein at least one of the means for writing and the means for reading follows a non-sequential addressing scheme; and

means for writing the bits to an output matrix.

16. (Currently Amended) The apparatus of claim 15, wherein the number of bits in the output matrix is equal to the number of bits in a transfer frame of the digital signal.

17. (Currently Amended) The apparatus of claim 15, wherein the bits in the internal matrix are arranged in a plurality of partitions.

18. (Original) The apparatus of claim 17, wherein each of the partitions comprises a plurality of blocks.

19. (Original) The apparatus of claim 17, wherein each of the partitions includes a group of the bits representative of a logical channel.

20. (Original) The apparatus of claim 19, wherein the bits in each logical channel are scrambled.

21. (Currently Amended) An apparatus of broadcasting digital information representative of data and/or audio in a digital audio broadcasting system, the apparatus comprising:

means for receiving a plurality of bits of a digital signal to be transmitted;

means for writing the bits of the digital signal to a an internal matrix;

means for reading the bits from the internal matrix, wherein at least one of the means for writing and the means for reading follows a non-sequential addressing scheme;

means for writing the bits to an output matrix;

means for mapping the bits to a plurality of carrier signals; and

means for transmitting the carrier signals.

22. (Currently Amended) The apparatus of claim 21, wherein the number of bits in the output matrix is equal to the number of bits in one of the transfer frames.

23. (Currently Amended) The apparatus of claim 21, wherein the bits in the internal matrix are arranged in a plurality of partitions.

24. (Currently Amended) The apparatus of claim 21 23, wherein each of the partitions comprises a plurality of blocks.

25. (Currently Amended) The apparatus of claim 21 23, wherein each of the partitions includes a group of the bits representative of a logical channel.

26. (Original) The apparatus of claim 25, wherein the bits in each logical channel are scrambled.

27. (Currently Amended) The apparatus of claim 21, further comprising:

means for channel coding the bits prior to the step of writing the bits of the digital signal to the internal matrix.

28. (Currently Amended) The apparatus of claim 21, further comprising:

means for scrambling the bits prior to the step of writing the bits of the digital signal to the internal matrix.

29. (Currently Amended) A method for deinterleaving received bits of a digital signal representative of data and/or audio in a digital audio broadcasting system, the method comprising the steps of:

writing a plurality of received bits of the digital signal to a an internal matrix;  
and

reading the bits from the internal matrix, wherein at least one of the writing and reading steps follows a non-sequential addressing scheme; and

writing the bits to an output matrix.

30. (Currently Amended) The method of claim 29, wherein the number of bits in the output matrix is equal to the number of bits in a transfer frame of the digital signal.

31. (Currently Amended) A method of receiving digital information representative of data and/or audio in a digital audio broadcasting system, the method comprising the steps of:

receiving a plurality of bits of a digital signal;  
writing the bits to a an internal matrix;  
reading the bits from the internal matrix, wherein at least one of the means for writing and means for reading follows a non-sequential addressing scheme;  
writing the read bits to an output matrix; and  
using the read bits to produce an output signal.

32. (Currently Amended) The method of claim 31, wherein the number of bits in the output matrix is equal to the number of bits in a transfer frame of the digital signal.

33. (Currently Amended) An apparatus for deinterleaving bits of a digital signal representative of data and/or audio in a digital audio broadcasting system, the apparatus comprising:

means for receiving a plurality of bits of a digital signal;  
means for writing the bits to a an internal matrix; and  
means for reading the bits from the internal matrix, wherein at least one of the means for writing and means for reading follows a non-sequential addressing scheme;  
means for writing the bits of the digital signal to an output matrix; and  
means for using the read bits to produce an output signal.

34. (Currently Amended) The apparatus of claim 33, wherein the number of bits in the output matrix is equal to the number of bits in a transfer frame of the digital signal.

35. (Currently Amended) An apparatus for receiving digital information representative of data and/or audio in a digital audio broadcasting system, the apparatus comprising:

means a receiver including circuitry for receiving a plurality of bits of a digital signal;  
means for writing the bits of the digital signal to a an internal matrix;  
means for reading the bits from the internal matrix, wherein at least one of the means for writing and means for reading follows a non-sequential addressing scheme;  
for writing the bits of the digital signal to an output matrix; and

means for using the read bits to produce an output signal.

36. (Currently Amended) The apparatus of claim 35, wherein the number of bits in the output matrix is equal to the number of bits in one of the transfer frames.

37. (New) A method for interleaving bits of a digital signal representative of data and/or audio in a digital audio broadcasting system, the method comprising the steps of:

writing a plurality of bits of the digital signal to an internal matrix in a convolutional interleaver, wherein the plurality of bits are arranged in a plurality of interleaver partitions;

reading the bits from the internal matrix; and

mapping bits from the interleaver partitions to frequency partitions in a radio signal.

38. (New) The method of claim 37, wherein the interleaver partitions include rows of bits and each row of bits is assigned to one of the frequency partitions.

39. (New) The method of claim 38, wherein each row of bits is mapped to one of the frequency partitions as a complex vector.

40. (New) The method of claim 38, wherein the rows of bits are processed sequentially.

41. (New) The method of claim 37, wherein the plurality of bits includes control data sequence bits, and the control data sequence bits are mapped to a reference subcarrier in the radio signal.

42. (New) The method of claim 37, wherein at least one of the writing and reading steps follows a non-sequential addressing scheme.

43. (New) The method of claim 37, wherein the radio signal comprises an orthogonal frequency division multiplexed signal and a row of bits in the matrix is processed for each symbol in the orthogonal frequency division multiplexed signal.

44. (New) The method of claim 37, wherein the plurality of bits of the digital signal comprises channel coded transfer frames.

45. (New) The method of claim 37, further comprising the steps of:

writing the bits read from the internal matrix to an output matrix;  
translating pairs of the bits from the interleaver partitions and individual bits  
from the output matrix into complex constellation values; and  
applying an amplitude gain factor to the complex constellation values.

46. (New) The method of claim 37, wherein the pairs of columns in the  
interleaver partitions are mapped to quadrature phase shift keying modulated subcarriers in  
the frequency partitions.